UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,201	07/22/2003	Jason Davis	C03-002	1241

23459 7590 03/02/2007

COGNEX CORPORATION
INTELLECTUAL PROPERTY DEPARTMENT
1 VISION DRIVE
NATICK, MA 01760-2077

EXAMINER	
STREGE, JOHN B	
ART UNIT	PAPER NUMBER
2624	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/02/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/625,201	DAVIS ET AL.	
	Examiner	Art Unit	
	John B. Strege	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-48* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-34 and 40-48* is/are rejected.

7)☒ Claim(s) *35-39* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/21/05,7/22/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-34,40-46 are rejected under 35 U.S.C. 102(b) as being anticipated by Shi et al. *Normalized Cuts and Image Segmentation* (published in 2000 by IEEE, hereinafter "Shi").

Shi discloses a method for partitioning a pattern into optimized sub-patterns (see the abstract and lines 6-8 of the first column of page 889), the method comprising: providing a list of features of the pattern (lines 22-28 of the second column of page 888); generating a set of candidate partitions using the list of features of the pattern (lines 29-32 of the second column of page 888 and also lines 23-25 of the first column of page 889); scoring each candidate partition of the set of candidate partitions (lines 25-29 of column 1 of page 889 describes the cut value which is a score given for each candidate partition); determining a best-scoring partition among the set of candidate partitions (see section 2.1 beginning on page 890, in figure 1 an optimal cut is selected to give the best partition); applying the best-scoring partition to the list of features so as to provide a plurality of sub-lists of features respectively representing a plurality of optimized sub-patterns (section 2.1 discloses that an eigenvalue problem can be solved based on the connection of all the nodes of the pattern in order to determine the best

eigenvalue to optimally partition the pattern, see also lines 1-15 of the first column of page 893).

Regarding claim 2, Shi discloses that the algorithm can recursively repartiontion the segmented parts if necessary thus using the sub-list of features generated by an earlier application (lines 12-13 of the first column of page 893).

Regarding claim 3, as seen in figures 2 and 3 Shi discloses providing an image and extracting a list of features from the image.

Regarding claim 4, as seen in figure 2 the image is sampled to provide a regular array of pixels.

Regarding claims 5-6, Shi discloses using an edge extraction method to provide an edge image and sampling the edge image to provide a plurality of edge feature points and each edge feature point includes the angle of the edge (lines 22-28 of column 2 on page 888).

Regarding claims 7-8, the features of the pattern are 2D image points (lines 22-28 of column 2 on page 888).

Regarding claims 9-10, Shi discloses that a set of points in an arbitrary feature space are represented as a weighted undirected graph (lines 23-28 of the second column of page 888).

Regarding claims 11-12, section 2 beginning on page 889 discloses a clustering algorithm as well as a spatial subdivision method to generate the set of candidate partitions.

Regarding claims 13-14, Shi discloses that the method yields pattern features that span an area of the pattern that is spatially small with respect to the area of the entire pattern and the algorithm looks at the distance relationship between features (section 2 grouping as graph partitioning beginning on page 889).

Regarding claim 15, Shi discloses building a weighted graph and partitioning the weighted graph (lines 22-34 of the second column of page 888).

Regarding claims 16-22, Shi discloses fully connecting the feature points to make a graph and setting the weights on each link (see section 3.1 beginning on page 891).

Regarding claim 23, Shi discloses dividing the weighted graph into two subgraphs and converting the two subgraphs into two sub-lists of features (see section 2 beginning on page 889).

Regarding claim 24, as read in the title the method of Shi involves Normalized cuts to generate candidate partitions.

Regarding claims 25-28, Shi discloses that the optimal partion is found (section 2 beginning on page 890).

Regarding claim 29, as discussed Shi uses the Normalized cut value to score the candidate partitions in order to find the optimal partitions.

Regarding claim 30, Shi discloses that the characteristics of the sub-pattern includes spatial coherence of the features corresponding to the sub-pattern (section 2 beginning on page 890).

Regarding claims 31-34, Shi discloses computing the optimal partition of the pattern (section 2.1 beginning on page 890).

Regarding claims 40-44, a threshold is used in section 3.1 for computing the optimal partition (see especially the numeral 4 of section 3.1).

Regarding claim 45, Shi discloses a method for automatically extracting a plurality of sub-patterns from a pattern in an image, the method comprising extracting a plurality of features (lines 22-28 of the second column of page 888); building a connected graph using the plurality of features (numeral 1 of section 3.1); and using the connected graph and a sub-division parameter to create a plurality of feature groups (numerals 3 and 4 of section 3.1).

Claim 46 contains similar limitations to claim 1, thus the same arguments used for the rejection of claim 1 apply equally to claim 46.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 47-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shi.

Regarding claims 47-48, Shi discloses in section 3.1 that the area and number of feature points are included in the optimal partition. Shi does not explicitly disclose that that the optimal partitioning is done in order to use the sub-patterns for an image search method, however it is well known that an image can be segmented and the

segmented part can be used as a template in searching an image thus the examiner declares official notice. It would be obvious to use the method of Shi to devise optimal partitions that can be used as a template for further image searching since it segments the parts of the image in an optimal manner.

Allowable Subject Matter

5. Claims 35-39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

USPGPUB 2004/0081346 Non-intrusive testing system and method.

USPN 6,636,634 Systems and methods for locating a pattern in an image.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John B. Strege whose telephone number is (571) 272-7457. The examiner can normally be reached on Monday-Friday between the hours of 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JS

BHAVESH M MEHTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600